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Knowledge, Attitude, and Practice of Pharmacists regarding Dietary Supplements

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Abstract

Background: Dietary supplement (DS) products are sold in pharmacies very widely. However, there is no specific approval or definition for the legal and scientific usage of such products. The study aims to evaluate pharmacist's knowledge, attitude, and practice regarding dietary supplements. Material and methods: A cross-sectional was designed to collect responses from community pharmacists in Saudi Arabia from February to April 2022. The data was collected via an anonymous, self-administered; postal questionnaire consisting of demographic information, knowledge (subjective and objective questions), attitude, and practice evaluation part. Descriptive and inferential statistics were performed using SPSS. Results: This study showed that although knowledge has a significant effect on attitude and practice, attention should be paid to other underlying factors such as experience, pharmacy ownership situation, and academic degree which might have a positive impact on pharmacists' practice. According to this study, although many underlying factors such as experience, and pharmacy ownership have an impact on pharmacy practice regarding dietary supplements, the most attention should be paid to knowledge as the main factor and more attention should be paid to training on dietary supplements could be recommended.

Keywords: *Dietary supplement; Food Supplementation; KAP study; Community pharmacist.*

Introduction

It is well known that pharmacists resemble the most important interface in the field of medicine. They are the executive partition of the treatment. The knowledge they gain and apply to the patients, whether as per the prescription assigned by doctors or based upon the request of the patients themselves, must by any means be superior to the level of application (1, 2). They are supposed to know precisely the goodness and badness of each application method for any kind of treatment. It is their job to convey certain results based on the scientifically approved method of the high boards and committees of medicine (1).

Moreover, following the improvement in health expectations of communities, more significant attention is attracted to complementary medicine (1). Dietary supplements (DS) are the most common subset of complementary and alternative medicines (CAM), a group of diverse medical and healthcare products that are not usually considered a part of conventional medicines (2). Following the increasing community awareness regarding the concern of prevention and treatment of diseases, the average consumption of CAMs has been dramatically increased, so that in 2007, about 40% of adults in USA used some form of CAM (3, 4). The popularity and use of dietary supplements (DS) increased in many developed countries (5). According to a survey conducted In Australia, 52% of the Australian population had used at least one non-physician-prescribed dietary supplement in 2003 that increased to 68.9% in 2007 (6, 7). This was 71% of the Canadian population in 2005(8). Dietary Supplement market is also increasingly growing in developing countries.

In Saudi Arabia, the country's market growth is expanding with the rapid population growth, and the food supplements market now accounts for about 4% of total pharmaceutical market sales (roughly $80 million) (9). Saudi Arabia is expected to see SR 875 million in sales of dietary supplements by 2023. This may be partly attributed to the fact that, in recent years, Saudis have increased their focus on the importance of maintaining health and protection from diseases (10). As consumers spend significant time and money on these products, the safe and effective use of these products could guarantee an appropriate health promotion. Pharmacists can be considered the most important resources in the health system and may have a great impact on public health (11).

Community pharmacists play an important role in patient training. However, studies show deficiencies in pharmacists-patients' communication regarding health products and their need for training to enable them to provide consulting services more effectively (12-14). Most consumers of DS presume the role of pharmacist include recommendation of effective DS products. However, the professional responsibilities of pharmacists with respect to these products have not been well distinguished and pharmacists do not play their professional role properly (15). Moreover, by increase the use of dietary supplements, the number of customers who ask pharmacists about these products has increased (16). In addition, due to nature of the therapeutic conditions, success of complementary medicines highly depends on finding the right therapy which may be different for each individual (17).

This motivated us to use knowledge, attitude and practice (KAP) study which assess knowledge, attitude and practice in three different sections and evaluate their correlation in KSA pharmacist population. Prior studies (18-20) show that consumers routinely ask their pharmacist for information about these products and seek for advice about DS as part of pharmacy practice. Recent survey of pharmacy customers in Australia shows that 87% of consumers expect the pharmacist to be able to provide them enough information about CMs efficacy, and 92% expect to receive safety information regarding these products.

Most DS consumers believe that the role of pharmacist should contain recommendations of effective DS products (20). In addition, pharmacists' reliability to detect and restrain interactions between CMs and conventional medications has been recognized in literature as an important issue (21). Despite these expectations, pharmacists mostly rate their own knowledge about CAMs as inadequate, and do not feel confident in answering patients' questions, and several studies have illustrated that, pharmacists' lack of knowledge or inadequate education on supplement products incapacitate them to provide informative consultation (16, 22-26), lack of confidence in introducing these products to their customers and, lack of skill (27, 28).

As, to the best of knowledge there is little study considering pharmacists knowledge, attitude and practice regarding dietary supplements in developing country context. Therefore, this study aimed to assess the knowledge, and measure the professional attitude and practice of pharmacists about dietary supplements. Knowledge means understandings but it does not necessarily lead to required behavior. Attitude is a way of being; a position which is not as directly observable as practices and practice is the observable behaviors of an individual (29-22).

Method

A cross-sectional was designed to collect responses from community pharmacists in Saudi Arabia from February to April 2022. Knowledge, attitude and practice (KAP) survey is applied for this study as the most popular and widely used method to assess the knowledge, attitude and practice. KAP survey may study the subjects which could be affected by social, cultural and economic factors, and may influence on the implementation of public health objectives. As usually at least one pharmacist must work at each pharmacy, the number of community pharmacies is considered as our target population.

The questionnaire was targeted to pharmacists in community pharmacies. Data was collected via an anonymous, self-administered postal questionnaire. The questionnaires were posted to all 500 pharmacies in KSA from February to April 2022. The questionnaire was a test of their knowledge, attitude, and practice of DS products and CAM in general. Researchers had divided the variables which differentiate them all in a number of categories. As for assessing the knowledge of the pharmacists about DS products, they were required to answer multiple choice questionnaire involving the pharmacodynamics, safety measures, and pathological effects of those products over the patients of several medical backgrounds. Then to measure the attitude of the pharmacists concerning the treatment with DS products, they were asked multiple questions about the ethical and legal modulus of dealing with DS products in several situations. To specify the practice of the pharmacists in dealing with DS products, they were asked to assess the performance of certain practices as whether they were to do it or not.

Validity of tools was examined for face and content by panel of jury group. This group was consisted of five professors specialized in pharmacology. Jury group examined tools carefully to judge its clarity, comprehensiveness and accuracy. Their opinions were elicited about the tools layout, components and scoring system. According to jury opinions the researchers modified minor items from the tools such as rephrasing some items and rearranging some items to be more accurate and clear. Data collection tool was assessed its reliability through measuring its internal consistency by using Cronbach's Alpha Coefficient test. The result was (0.83) for tool.

The pilot study was done on 10% of total study sample. The aim of the pilot study was to investigate the applicability of the study tools, clarity of language, test the feasibility and suitability of tools. It also estimate the time needed to complete the forms by each subject and identifying potential obstacles that may be encountered during data collection. The time to fill the tools took around 15-25 minutes. There is no modifications were done so the study subjects included in the pilot were included in the main study sample.

This study was reviewed and approved by the Institutional Review Board (IRB) of University. The survey introduction informed the pharmacists about their voluntary participation in the survey, the anonymity and confidentiality of the collected data, and their right to withdraw their information at any time by contacting the researchers. Descriptive and inferential statistics were calculated using the Statistical Package for Social Sciences (SPSS version 28).

Result

Table (1) show that more than two-thirds (65.8%) of the study participants were males, more than half (50.2%) of them had less than five years of experience in pharmacy practice. The majority of study participants (79.4%) were technical responsible in the pharmacy. Regarding education level, the great majority (94.2%) of them had Pharm D, more than one-third (37.2%) of the studied participants had age ranged from 25 to 35 years old.

Table (2) Descriptive and reliability analysis show that overall reliability of questions according to Cronbach's alpha reaches to 0.83 which indicate an acceptable reliability. Moreover, descriptive parameters including mean and standard deviation (SD) corresponding to each question and Cronbach's alpha corresponding to each dimensions (knowledge, attitude and practice) are provided.

Table (3) Exploratory factor analysis show that the KMO (Kaiser-Mayer-Olkin) values were 0.89, 0.56 and 0.87 for knowledge, attitude and practice respectively, which show statistical capability for further reduction. Besides exploratory factor analysis, to understand the relationship between the observed and latent factors, and to test uni-dimensionality of dimensions, confirmatory factor analysis has

been employed. Extracted variables showed that all 3 components have contributed to nearly 60% of the total variance, whereas the average variance extracted regarding each component of KAP is above 50% indicating high uni-dimensionality.

Moreover, correlation analysis shows that there are positive and significant relationships between three components of the KAP variable, so that the impact of knowledge on practice is more than on attitude. Furthermore, result of correlation shows that attitude has a positive and significant effect on practice. However, the correlation coefficients in the aforementioned test do not show a strong relationship between the studied variables.

Table (4) show that the score of respondents (mean ± SD: 1.542 ± 0.919) was categorized based upon expert's opinion accordingly; which above 70% was considered excellent, 60-70% good, 40-60% average and less than 40% weak and poor. As mentioned in Table 4, results show that around 62% of respondent has week practical knowledge, 21% of our sample has average level of practical knowledge and around17% of participants could get good and excellent score. In addition, there are not any significant differences in scores of different groups of gender, age, experience, educational background.

Table (5) the relationship among demographic profile of participants with three components of KAP variables, show that, there is not any significant difference between genders in attitude and practice. Conversely, the variable of knowledge which subjectively evaluated shows a significant difference with gender item. So, men participants are more likely knowledgeable than women participants according to dietary supplements, and it can be explained that men participants may have more self- confidence. Considering different age and experience groups, there are not any significant differences in attitude; conversely knowledge is growing by age and experience. More interestingly, practice score is growing up to 45 years old and 20 years of experience, and then decline.

Moreover, there is a positive relationship between education level and all component of KAP, so that participants with higher academic degree have, the more knowledge, attitude and practice in dietary supplements have, and it also can be explained same to gender variable. Related to ownership variable, it has significant

and positive effect on knowledge, attitude and practice of pharmacist.

Table (1): Demographic and Background Characteristics of participants (N=500).

Characteristics	Categories	Number (%)
Gender	Male	329 (65.8)
	Female	171 (34.2)
Age (years)	Under 25	165 (33.0)
	25-35	186 (37.2)
	36-45	89 (17.8)
	Above 45	60 (12.0)
Education	Pharm D	476 (95.2)
	PhD	24 (4.8)
Experience in pharmacy practice (years)	Less than 5	251 (50.2)
	5-10	122 (24.4)
	11-20	78 (15.6)
	More than 20	49 (9.8)
Position in the pharmacy	Technical responsible	402 (80.4)
	Owner	98 (19.6)

Table (2): Descriptive and reliability analysis of KAP questionnaire.

Questions	Mean	SD	Cronbach's alpha
Knowledge (subjective approach)			
1. Generally I have sufficient information toward dietary supplement.	3.46	0.73	0.86
2. I have sufficient information about efficiency and effectiveness of dietary supplement.	2.89	0.87	
3. I have sufficient information about adverse effects of dietary supplement.	3.32	0.77	
4. I have sufficient information about dosage and administration of dietary supplement.	2.96	0.81	
5. I have sufficient information about indications of some dietary supplement in specific groups such as pregnancy, breast feeding, pediatric and geriatric.	3.25	0.77	
6. I have sufficient information about drug-supplement interactions.	2.99	0.86	
7. I have sufficient information about contraindication of dietary supplement and in special groups of patient for example with hypertension or kidney disease.	2.85	0.79	
Attitude			
1. Dietary supplements have a positive impact on public health.	2.96	0.87	0.61
2. Therapeutic efficacy of dietary supplement may be considerable.	3.63	0.78	
3. Pharmacists should be knowledgeable about supplements and consulting in this field is partof pharmacist's duties.	3.31	0.88	
4. Supplement should dispense according to the nutritionist or physicians prescription.	2.25	0.90	
5. Supplement should be sold in pharmacies under pharmacist's supervision.	3.03	0.87	
6. Supplements considered as an important source of profit for pharmacies.	3.89	0.87	
7. Price is important factor for recommending supplements to	3.29	0.96	

Questions	Mean	SD	Cronbach's alpha
customers.			
8. Customers usually are influenced by Pharmacist's comments about supplements.	3.68	0.90	
Practice			
1. I always allot enough time for giving advice to customers on supplements.	3.91	0.77	0.81
2. I've studied some scientific references regarding to supplements.	3.60	0.75	
3. I could refer to valid Web Pages and scientific references relevant to dietary supplement in case 4. of needed.	3.16	0.81	
5. I always recommend supplements to consumers with confidence about their effectiveness.	3.27	0.86	
6. I always inform consumers about possible adverse effects of dietary supplements.	3.41	0.85	
7. I always advise consumers about dosage and administration of supplements.	3.44	0.82	
8. I always ask consumer's medical history when I recommend these products.	3.57	0.75	
9. I always check whether particular supplement taken by consumer interact with her/his prescription medicines.	3.56	0.77	
10. I always inform consumers about drug-supplement interactions.	3.50	0.84	
11. I have self-confidence for recommending supplement.	3.43	0.87	

KAP: knowledge, attitude, practice; SD: standard deviation

Table (3): Descriptive, correlation and factor analysis

Dimensions	Mean	SD	KMO	AVE	Factor loading	Knowledge	Attitude	Practice
Knowledge	3.10	0.59	0.89	0.55	0.65-0.80	1	0.29**	0.43**
Attitude	3.33	0.34	0.56	0.63	0.53-0.70	0.29**	1	0.31**
Practice	3.51	0.60	0.87	0.61	0.64-0.74	0.43**	0.31**	1

** Correlation is significant at the 0.01 level (2-tailed).

SD: standard deviation; KMO: Kaiser-Mayer-Olkin; AVE: Average Variance Extracted

Table (4): Descriptive results of objective practical questions about pharmacists' knowledge

Scoring category	Number (%)
Poor	23 (4.6)
Weak	288 (57.6)
Average	105 (21.0)
Good	63 (12.6)
Excellent	21 (4.2)

Table (5): Participants' characteristics and KAP components

Grouping Variable		Test Variables Mean Rank			
		Knowledge	Attitude	Practice	Knowledge test Score
Gender	Sig. (2-tailed)	**.000**	0.696	0.815	0.138
Age Categories	Sig. (2-tailed)	0.452	**0.000**	**0.000**	0.316

Grouping Variable		Test Variables Mean Rank			
		Knowledge	Attitude	Practice	Knowledge test Score
(Years)					
Experience Categories (Years)	Sig. (2-tailed)	0.149	**0.000**	**0.000**	0.131
Education level	Sig. (2-tailed)	**0.000**	0.020	**0.000**	0.503
Ownership Position	Sig. (2-tailed)	0.000	0.003	0.000	0.402

Discussion

Following improvement in the quality of life and people heath expectation, the market of dietary supplements is dramatically grown. As it leads to significant expenditure in health system, its public heath impact should be considered (23-29). Community pharmacies as the important part of health system providing health services for public health are in the best position to consult customers with evidence-based information about dietary supplements. However, according to the previous studies, customers usually are not satisfied by the information received from pharmacists, and also pharmacists are not confident enough to provide such information to their customers (30-34).

The previous studies explored that the lack of some factors such as information and understanding of the advantages of DS for general health maintenance, prophylaxis of disease and remedy of minor conditions, knowledge of specific DS products and profile of the DS' company, may raise customers unsatisfactory (17, 29, 31-37). The most significant pharmacists' barrier to communicate on DS is lack of scientific evidence availability, and also lack of training, lack of accurate and accessible information, lack of reimbursement, legal concerns, time constraints; whereas suggestion of DS products by pharmacies' staff can be added to aforementioned barrier (9, 23, 38, 39).

Proper use of DS products not only can positively impact public health, but also may enhance the esteem of the pharmacy. Therefore, it is considerable to fulfill the consumer's expectations through the pharmacist-consumer relationship, and more attention should be paid to professional responsibilities of pharmacists about dietary supplements especially in developing countries (8, 23, and 40). Moreover, effective pharmacist communication with patients resulted in economic and humanistic outcomes (41). To figure out the main factors which affect the final practice of pharmacists on DS, we choose KAP study to discover gaps to propose proper intervention.

Comply with expectation; there is a positive and significant relationship between three components of KAP variable. It implies higher knowledge participants have, the more likely they have better attitude and practice. But the correlation coefficients do not show strong relationship between KAP components, so that attitude and practice not only are mainly influenced by knowledge but also are influenced by context, environment and other underlying factors such as pharmacy ownership. In addition, the impact of knowledge on practice is more than on attitude. Related to correlation analysis, results show that attitude has a positive and significant effect on practice, so it is important to find out the attitude influencers to improve practice of pharmacists.

The present study show that more than half of respondents have a week knowledge without any significant differences in scores of different groups of gender, age, experience, education and university. It shows that more attention should be paid to the educational material in university and continuous training courses. Considering demographic profile of participants with three components of KAP variables, some interesting results were provided. Although, men participants are more

likely knowledgeable than women participants about dietary supplements, the results does not show any significant differences between genders in attitude and practice.

This implies that attitude and practice might be influenced by some other underlying factors like age, experience, education and ownership situation. Ownership variable has a significant and positive effect on knowledge, attitude and practice of pharmacists, so that pharmacy owners not only show higher attempt on practice, but also show higher level of knowledge and attitude. Given to age and experience groups, although knowledge is growing by age and experience, practice score is growing up to age 45 years old and 20 years' experience and then decline. The positive relationship between education level and all component of KAP show that education not only has an indirect effect on practice through knowledge improvement, but also has direct effect on attitude and practice of pharmacists. So, the results strongly recommend higher education for better practice.

This study strongly recommends higher education and more structured training schedule for pharmacists. In addition, attention should be paid to experience as an important factor. Moreover, the results recommend ownership factor as an important incentive can increase practice of pharmacists regarding dietary supplement. As usually this kind of products have high benefit margin, the owner pharmacists are more interested to learn more about them to sell more.

Actually the best way for practice evaluation is observation; there are some studies which use self-evaluation for practice (42, 43). Finally as the attitude and practice are highly affected by many other factors such as pharmacists remuneration models (43), further studies should explore other underlying factors on attitude and practice of pharmacists.

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